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pursue the subject. The publication of the reduction of the ancient Greenwich planetary observations by the Astronomer Royal gives, in connexion with his own series of observations, a mass of materials extending, with some interruptions, over nearly a century, and offers means for the determination of the secular variations of the elements. Mr. Breen has availed himself of all these materials as far as the year 1847. All the comparisons of the observations of *Mars* have been made with Lindenau's Tables; and through the whole series there is no other deviation from uniformity than the introduction of Mr. Airy's corrected mass of *Jupiter* in the calculations of the perturbations produced by that planet on *Mars*, for all the observations included in the planetary reductions, this correction not being included in the computations of the Berlin *Jahrbuch*, with which the places for 1833 have been compared, nor in the computations of the *Nautical Almanac* for the succeeding years. To produce strict uniformity, Mr. Breen has calculated the perturbations of *Jupiter* for each normal day from 1833 to 1847, and increased the results by $\frac{1}{50}$th part. The resulting corrections form the first table of his work.

Mr. Breen gives a brief statement of the method used by Lindenau, and of the materials employed by him in the deduction of his elements: he gives afterwards an account of his own methods. The formulæ and equations of condition used by Mr. Breen are of the same form as those used in his former papers on the corrections of the elements of the orbit of *Venus*. In the course of the work, a trifling error made in the planetary observations, by the use of wrong transit intervals for a short period, has been corrected and allowed for. The whole series of equations is divided into the following distinct groups of several years, depending on the continuity of the observations, viz. from 1751 to 1768; from 1790 to 1798; from 1820 to 1830; from 1833 to 1839; and finally from 1840 to 1847; and the corrections of the elements resulting from the solution of the equations are given separately for each group.

Determination of the Parallax of α^1 and α^2 Centauri.

By Mr. Maclear.

In this noble series, *both* stars have in almost all cases been observed with the mural circle, by reflexion and by direct vision at the *same* transit. The observations were made in the years 1842, 3, and 4, and again in 1848. The intervening years were spent on the great arc of meridian, which is now happily terminated. There are 192 double altitudes of α^1 *Centauri* and 199 of α^2 *Centauri*, and it must be borne in mind that each double altitude gives a result either free from instrumental error, or one in which the instrumental error is probably a constant. The series is divided into three groups. In the first and third groups the variable quantities of parallax and aberration run through a period or more. In the second group they run through a large part of a period.

The notation and mode of reduction is that followed by Mr.

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Henderson in vol. xii. of our *Memoirs*, and the results are contained in three tables.

In Table I. we have the instrumental readings for each star observed by reflexion and directly, with the corresponding readings of the barometer and thermometers.

In Table II. each double altitude is corrected for refraction and reduced to its *mean* value for January 1 of the year of observation, and also for January 1, 1849.

Table III. contains the coefficients of parallax and of the correction to be applied to the assumed constant of aberration, as well as of the annual proper motion of each star to reduce the place to January 1, 1849. The excess of the *observed mean* altitude for 1849 above an *assumed mean* altitude is also given, and thus an equation of condition is formed for every observation of each star. We have thus six sets of equations for the two stars, each of which is solved by the method of least squares.

As a final result Mr. Maclear finds that

the parallax of α Centauri = 0″·9187 probable error = 0″·034
the constant of aberration = 20·53 probable error = 0·038

The former investigation in vol. xii. of the *Memoirs* gave 0″·9128 for the value of the parallax of α *Centauri*, and 20″·52 for the constant of aberration.

Mr. Maclear adds that his valued first assistant, Mr. Mann, has commenced a fresh series of observations of this remarkable star with the mural circle, and that he is himself attacking the parallax in right ascension with the 8½-foot equatoreal. At the Cape and at Madras, observations for determining the orbit are making very diligently and with powerful equatoreals.

Observations of Zodiacal Light in 1851. By Mr. Lowe, Highfield House, near Nottingham.

January 22^{d} 6^{h} 30^{m}.

Apparent, but confused.

January 23^{d} 7^{h}.

Tolerably brilliant by fits, situated between α and β *Pegasi*; the edges too confused to enable them to be accurately marked.

January 27^{d} 7^{h}.

Brilliant by fits, the upper edge to the west of *Saturn*; the north edge passed near α *Pegasi*.

March 20^{d} 8^{h}.

Stars bright. The zodiacal light is better defined on its edges than it had been noticed here this year.

Extent of base on horizon, 23° 30′. Its southern edge cut the horizon 1° 30′ S. of W., and its northern edge 22° N. of W.

	°	′
Mean Long. of Apex	49	30
Maximum Long. of Apex......	51	0
Minimum Long. of Apex......	48	0

Axis, 0° 15′ N. of Pleiades, and the horizon 10° 15′ N. of W.

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